CLAIMS

We claim:

1. A fixation device for implantation in a biological vessel comprising:

a frame comprising a longitudinal axis,

wherein the frame is configured to expand at variable amounts circumferentially with respect to the longitudinal axis.

2. The device of Claim 1, wherein the frame comprises a first section and a second section, and wherein the first section remains fixed with respect to the vessel.

3. The device of Claim 2, wherein the second section comprises about 180 contiguous degrees of the device.

4. A vascular fixation device comprising:

a first fixation section;

a first arm comprising a first end and a second end, wherein the first end is attached to the first fixation section; and

a second fixation section, wherein the second end of the first arm is attached to the second fixation section.

5. The device of Claim 4, further comprising a second arm comprising a first end and a second end, wherein the first end of the second arm is attached to the first fixation section, and wherein the second end of the second arm is a terminus.

6. The device of Claim 5, further comprising a third arm extending from the second fixation section.

7. A vascular fixation device comprising:

a first fixation section;

a first arm extending from the first fixation section, wherein the first arm comprises a first end, and wherein the first end of the first arm comprises a terminus; and

a second arm extending from the first fixation section, wherein the second arm comprises a first end, and wherein the first end of the second arm comprises a terminus.

8. The device of Claim 7, wherein the first arm extends from the fixation section in a first direction and wherein the second arm extends from the fixation section in a second direction and wherein the first direction is substantially opposite to the second direction.

9. The device of Claim 7, further comprising a graft attachment device comprising a first end and a second end, wherein the first end of the graft attachment device is attached to the fixation section.

10. The device of Claim 9, wherein the second end of the graft attachment device is attached to a first vascular graft.

11. The device of Claim 10, wherein the second end of the graft attachment device is attached to a second vascular graft.

12. The device of Claim 9, wherein the first end of the graft attachment device is attached to the fixation section near the vascular wall.

13. The device of Claim 9, wherein the graft attachment device is configured to radially expand when the graft attachment device is subject to a force in the direction of the graft.

14. The device of Claim 9, wherein the fixation section comprises a tissue anchoring device.

15. The device of Claim 14, wherein the tissue anchoring device comprises holes in a surface.

16. The device of Claim 14, wherein the tissue anchoring device comprises a spike.

17. The device of Claim 14, wherein the tissue anchoring device comprises a tab.

18. The device of Claim 17, wherein the tab is directed at least in part into the vascular wall.

19. The device of Claim 7, wherein the first arm is longitudinally distanced from the second arm.

20. The device of Claim 7, wherein the first arm comprises a first helical section.

21. The device of Claim 9, wherein the second arm comprises a second helical section.

22. The device of Claim 7, wherein the first arm comprises a first strut, a first member, and a second member, and wherein the first strut comprises a first end and a second end, and wherein the first end of the first strut is attached to the first member and the second end of the first strut is attached to the second member.

23. The device of Claim 22, wherein the second arm comprises a second strut, a third member, and a fourth member, and wherein the second strut comprises a first end and a second end, and wherein the first end of the second strut is attached to the third member and the second end of the second strut is attached to the fourth member.

24. The device of Claim 7, wherein the first arm rotates less than about 180 degrees around the vascular wall.

25. The device of Claim 24, wherein the second arm rotates less than about 180 degrees around the vascular wall.

26. An assembly comprising:

a first device of Claim 7,

a device extender comprising a first end and a second end, wherein the first end of the device extender is attached to the first device of Claim 7, and

a second device of Claim 7, wherein the second end of the device extender is attached to the second device of Claim 7.

27. A device for fixing to a vascular wall comprising:

a fixation section;

a first arm extending from a first side of the fixation section;

a second arm extending from a second side of the fixation section; and

a graft attachment device comprising a first end and a second end, wherein the first end of the graft attachment device is attached to the fixation section.

28. The device of Claim 27, wherein the first arm extends from the fixation device in a first direction and wherein the second arm extends from the fixation device in a second direction and wherein the first direction is substantially opposite to the second direction.

29. The device of Claim 27, wherein the second end of the graft attachment device is attached to a first vascular graft.

30. The device of Claim 29, wherein the first vascular graft comprises a bifurcated graft.

31. The device of Claim 30, wherein the second end of the graft attachment device is attached to a second vascular graft.

32. The device of Claim 27, wherein the first end of the graft attachment device is attached to the fixation section near the vascular wall.

33. The device of Claim 27, wherein the graft attachment device is configured to radially expand when the graft attachment device is subject to a force in the direction of the graft.

34. The device of Claim 27, wherein the first arm is axially distanced from the second arm.

35. The device of Claim 27, wherein the first arm comprises a first helical section.

36. The device of Claim 35, wherein the second arm comprises a second helical section.

37. The device of Claim 27, wherein the first arm rotates less than about 180 degrees around the vascular wall.

38. The device of Claim 37, wherein the second arm rotates less than about 180 degrees around the vascular wall

39. The device of Claim 27, wherein the fixation section comprises a tissue anchoring device.

40. The device of Claim 39, wherein the tissue anchoring device comprises a surface comprising holes.

41. The device of Claim 39, wherein the tissue anchoring device comprises a spike.

42. The device of Claim 39, wherein the tissue anchoring device comprises a tab.

43. The device of Claim 42, wherein the tab is directed at least in part into the vascular wall.

44. An assembly comprising:

a first device of Claim 27,

a device extender comprising a first end and a second end, wherein the first end of the device extender is attached to the first device of Claim 27, and

a second device of Claim 27, wherein the second end of the device extender is attached to the second device of Claim 27.

45. An assembly for fixing to a vascular wall comprising:

an anchor; and

a graft comprising a first end, wherein the graft is attached to the anchor, and

wherein the assembly is configured that when a force is applied pushing the graft away from the anchor then the first end of the graft radially expands.

46. A method of attaching a vascular prosthesis to a vascular wall comprising:

deploying a fixation device in a vessel, wherein the fixation device comprises a fixation section, a first arm extending from the fixation section, and a second arm extending from the fixation section,

attaching a vascular prosthesis to the fixation device.

47. A method of using a vascular prosthesis comprising a first leg, a second leg and a trunk attached to the first leg and the second leg, the method comprising:

deploying the first leg into a first iliac artery,

then extending the trunk across the aneurysm.

48. The method of Claim 47, further comprising deploying the second leg into the second iliac artery before extending the trunk.

49. A method of using a vascular prosthesis at a vascular site, the prosthesis comprising a first leg and a second leg, and wherein a bifurcation angle is formed between the first leg and a second leg, the method comprising:

configuring the vascular prosthesis so the bifurcation angle is greater than about 120 degrees,

deploying the vascular prosthesis at the vascular site.

50. The method of Claim 49, further comprising causing the bifurcation angle of the vascular prosthesis to decrease, during or after the vascular prosthesis is deployed.